Amendments to the Specification

Paragraph at page 1, lines 13-20:

Batch substrate processing continues to be used in fabricating semiconductor integrated circuits and similar micro structural arrays. In batch processing, many silicon wafers or other types of substrates are placed together on a wafer support fixture in a processing chamber and simultaneously processed. Currently, most batch processing includes extended exposure to high temperature, for example, in depositing planar layers of oxide or nitride or annealing previously deposited layers or dopants implanted into existing layers. Although horizontally arranged wafer boats were originally used, vertically arranged wafer towers are now mostly used as the support fixture to support many wafers one above the other.

Paragraph at page 3, line 22 to page 4, line 12:

It is believed that the process produces the structure illustrated very schematically in cross section in FIG. 3. Two silicon members 30, 32 are separated by a gap 34 having a thickness of about 50μm (2 mils). The thickness of the gap 34 represents an average separation of the leg 12 and the base 14 of FIG. 2 as the end 26 of the leg 12 is at least slidably fit in the mortise hole 24. The gap thickness cannot be easily further reduced because of the machining required to form the complex shapes that guarantee alignment and because some flexing of assembled members is needed to allow precise alignment of the support surfaces and other parts. A coating of SOG is applied to at least one of the mating surfaces before the two members 30, 32 ~~12, 14~~ are assembled such that the SOG fills the gap 34 of FIG. 3. Following curing and a vitrification anneal, the SOG forms a silicate glass 36 that is extremely schematically represented in the figure as a three-dimensional network of silicon and oxygen atoms and their bonds. Note that the silicon-oxygen ~~silicon- oxygen~~ bond lengths are on the order of a nanometer in comparison to the tens of micrometers for the gap. The silicate glass 36 may be referred to as silica having a composition of approximately silicon dioxide (SiO_2) and forms as an amorphous solid with most

silicon atoms bonding to four oxygen atoms and most oxygen atoms bonding to two silicon atoms. The figure shows oxygen atoms bonding to silicon atoms in the silicon members 30, 32 at the silicon surfaces 38, 40. However, the structure is in reality more complex since the silicon members 30, 32 likely have a thin native oxide layer, that is, of SiO_2 at their surfaces 38, 40. The vitrification anneal rearranges some of the oxide bonds to bond instead to oxygen or silicon atoms in the silica glass 36.

Two paragraphs at page 5, lines 6-20:

In one embodiment, the silicon powder is milled <u>or otherwise</u> formed from virgin polysilicon. In another embodiment, the silicon powder is grown as very small particulates in a chemical vapor deposition (CVD) process. The milled powder preferably has a particle size of less than 100μm, preferably between 1 and 50μm. The CVD powder may have a much smaller size, for example, generally spherical shapes with particle sizes less than 100nm, for example, having a distribution peaking at between 15 and 25nm.

The bridging agent may be a spin-on glass used in forming oxide dielectric layers <u>during</u> semiconductor fabrication. A retardant may be added to the mixture to slow setting at room temperature. Advantageously, the CVD powder does not require a retardant. The mixture is applied to the joining areas, the members are assembled, and the structure annealed at a temperature sufficient to form a silicon-oxygen network. The annealing temperature is generally above 400°C. When milled silicon powder is used to form silicon fixtures for supporting wafers or other wafer processing equipment, the annealing temperature is preferably above 1200°C and more preferably at least 1300°C. However, the CVD powder allows annealing at 1100°C and below.

Paragraph at page 5, lines 25-27:

Such silicon/silica composite adhesives may <u>be</u> advantageously used to form larger parts from smaller silicon pieces, for example, a plate from multiple bars or a tube from multiple staves as in a barrel.

Paragraph at page 6, line 9:

~~FIGS~~ FIGS. 6 and 7 are axial cross-sectional view of two leg shapes.

Paragraph at page 6, line 21 to page 7, line 2:

In one embodiment of the invention, virgin poly is ground or milled to a fine powder. Milled powdered virgin poly is available from MEMC in three size grades: less than 1µm; between 1 and 75µm; and between 75 and 125µm. The largest size is too large for typical joints. The finest size is probably usable, but such small silicon powder can be explosive because of the large heat of enthalpy of silicon dioxide. The medium size still contains particles too large for the joint. Nonetheless, it or possibly the large-sized powder can be ground before use to a smaller maximum size, preferably using a silicon pestle and silicon mortar. It is estimated that the particle size after grinding is less than [[-325]] 325 mesh, that is, a maximum diameter of less than approximately 75µm. Such a size conforms to the size of the gap.

Paragraph at page 10, line 25 to page 11, line1:

The nano-silicon was substituted for the milled silicon powder in one of the above mentioned recipes with recipe of 3:1:1 of Fox 17, silicon powder, and terpineol by weight. The strength tests indicated a significantly stronger bond than using milled silicon. The adhesive also seemed to take somewhat longer to set up at room temperature and to cure at a lower annealing temperature. The joints, when broken, showed a whitish-grey color different from the blacker color when [[using]] the milled silicon powder was used.

Two paragraphs at at page 11, lines 3-22:

In view of the positive trend with using nano-silicon powder, another series of tests was [[were]] performed using a recipe of 3:1 of FOx and nano-silicon powder, that is, no terpineol or other retardant. The adhesive was observed to set up in about 15 minutes, significantly more than the 5 minutes with milled silicon powder without a retardant. The 15 minute setting time is considered sufficient to assemble and align a structure. The adhesive was annealed at 1100°C in

air for between 15 and 20 hours. The final composition of the cured adhesive is estimated to be 60% silicon and 40% SiO_2 by weight although the local chemical composition at this time is not clear.

Six test structures were fabricated and tested for joint strength. Five of the structures included pairs of virgin polysilicon bars or rectangular rods. The break strengths were measured at 170, 374, 417, 561, and 714 lb/cm respectively. The rod ends at the fractured joints were inspected. All five virgin poly structures <u>showed</u> [[show]] a fairly uniform and smooth grey surface with perhaps some chip-like areas at the corner indicating cleavage of the underlying silicon rather than of the bond. The weakest structure was observed to contain a protrusion matching a corresponding feature across the joint and having a size of perhaps a hundred microns. It is believed that the protrusion prevented the otherwise smooth surfaces from being joined in close proximity. That is, the adhesive was excessively thick in this case. The sixth test structure included one virgin polysilicon rod and one crystalline Czochralski rod. The break strength was 680 lb/cm. The broken joint indicated that the underlying crystalline material broke on Czochralski cleavage planes, and that the adhesive did not break.

Paragraph at page 13, lines 5-12:

An improved leg 70 of a second embodiment illustrated in the axial cross-section of FIG. 7 is similar except that two second straight portions 72, 74 are smoothly joined to the inclined straight sides 54, 56 and tangentially connected to an arcuate back 76, which may have a somewhat smaller size than the back 58 of FIG. 6, but still curves continuously across the medial plane 60. [[.]] Preferably, the second straight portions 72, 74 are parallel to each other, in which case if the back 76 is circular, it extends for 180°. In either embodiment, more complicated shapes of the arcuate portions 52, 58, 76 are possible, especially for the narrow tip 52.